

FACT SHEET

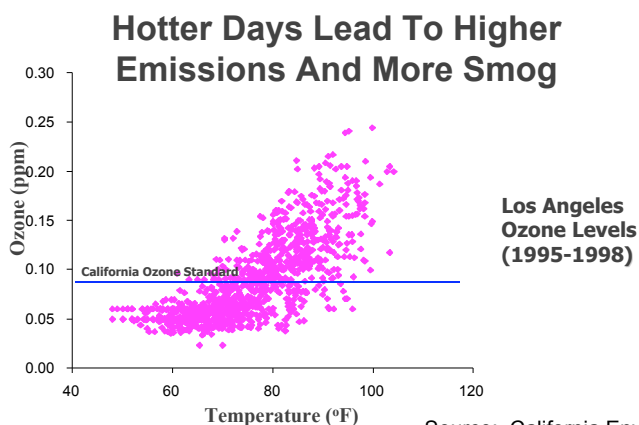
Air Quality and Health Impacts of Greenhouse Gas Emissions and Global Warming

Global warming is well recognized by scientists around the world as a serious public health and environmental concern. As atmospheric concentrations of greenhouse gases rise globally, temperatures on earth are increasing. While the greenhouse effect has been beneficial to maintain global temperatures compatible to human life, recent increases in average temperatures due to human activities are causing great alarm. Hotter temperatures due to global warming are expected to lead to increased weather extremes including heat waves and worsening of air quality.

How Does Global Warming Affect Air Quality?

Californians already experience the worst air quality in the nation, with more than 95 percent living in areas with unhealthy air according to the California Air Resources Board. Currently, approximately one out of every three days is considered unhealthy for ozone pollution (based on California's own health-based air quality standards) in areas such as the South Coast Air Basin and the San Joaquin Valley. Unfortunately, global warming is expected to worsen pollution problems.

Hotter Days Facilitate Ozone Formation: Higher temperatures, strong sunlight and a stable air mass are ideal for formation of ground level ozone. Ozone (O₃) is an extremely reactive gas that essentially attacks lung tissue by reacting chemically with it. It is the primary ingredient of smog air pollution and very harmful to breathe. EPA studies and other studies designed to examine the impacts of increased temperatures from global warming have determined that global warming will likely lead to an increase in peak ozone levels. In addition, the National Research Council of the National Academies has linked global warming to increased ozone levels in two recent reports.



Source: California Environmental Protection Agency

Hotter Days Lead To More Smog Emissions: Hotter summer weather leads to increased emissions of ozone precursors, particulate matter and toxic air contaminants from increased energy production, electricity use, fuel evaporation and other sources. During hot summer days, air conditioners are utilized more frequently, leading to increased demand for electric power production and associated increases in smog-forming pollutants, such as nitrogen oxide (NOx) and hydrocarbons. Increased mobile air conditioning usage also leads to higher pollution emissions.

Heat Waves And Public Health: The heat waves in Europe in summer, 2003 provide a case study of heat-related ozone impacts on public health. During the heat waves thousands of excess deaths occurred above the average recorded for that time of year. Epidemiological studies of deaths during the heat waves suggest that a substantial portion of the mortality could be attributed to elevated ozone and particulate levels that occurred during the heat waves. Two studies suggest that 20 percent to 50 percent of the total excess deaths were due to elevated ozone and particle levels.

What are the Health Effects of Air Pollution?

According to the California Air Resources Board the annual health impacts of exceeding state health-based standards for ozone and particulate matter include:

- 6,500 premature deaths
- 4,000 hospital admissions for respiratory disease
- 3,000 hospital admissions for cardiovascular disease
- 350,000 asthma attacks
- 2,000 asthma-related emergency room visits
- Elevated school absences due to respiratory conditions, including asthma
- Reduced lung function growth rate in children

Sensitive groups, including seniors, people with heart or lung disease, children and infants are the most vulnerable to the harmful effects of air pollution. Low-income communities and communities of color are also especially vulnerable to pollution-related health impacts due to the multiple pollution sources located in these communities and their often limited access to health care.

California's Regulations To Curb Greenhouse Gas Emissions Will:

Help To Slow The Pace Of Global Warming: The consensus of the scientific community is that greenhouse gas build-up in the atmosphere is responsible for the increasing average temperatures on earth. Actions to curb greenhouse gas generation are the most important way to tackle this problem. California's regulatory program to control vehicle greenhouse gas emissions pursuant to AB 1493 (Pavley, 2002) will not only reduce the state's contribution to the global warming problem, but will also provide vital leadership on this issue and promote similar actions by other states and countries.

Reduce Fuel Related Emissions: Actions to control greenhouse gases from vehicles will also reduce direct emissions of criteria and toxic pollutants emitted from the transportation sector. According to the CARB staff proposal (June 2004), an important byproduct of the AB 1493 regulations will be reduced pollution emissions from the transportation, delivery and sale of gasoline (called "upstream emissions") due to reduced petroleum use. Upstream emissions are a significant portion of vehicle emissions that contribute to unhealthy air, and can be expected to account for up to 25 percent of vehicle-related emissions by 2020. Given California's extreme

air quality situation, all feasible emission reductions, including upstream emission reductions from the petroleum fuel cycle, are needed to make progress toward improved air quality.

Promote The Drive Toward Cleaner Technologies: California's regulatory actions to control greenhouse gases should encourage continued development of alternative fuels and technologies. Although the California vehicle global warming regulations will not require specific technologies, use of hybrid electric, alternative fuel and advanced technology vehicles that have extremely low emissions of ozone precursors (such as those powered by natural gas, electricity and fuel cells) would be counted toward regulatory requirements.

Resources For More Information:

American Lung Association of California Position Statement, Air Quality and Health Impacts of Greenhouse Gases and Global Warming, Approved June 5, 2004

<http://www.californialung.org/press/GHGGlobalWarmingPosStmt60504pdf.pdf>

Recent Research Findings: Health Effects of Particulate Matter and Ozone Air Pollution (California Air Resources Board and American Lung Association of California)

http://www.californialung.org/downloads/hn/Research_HealthEffects_PartuculateMatter.pdf

IPCC (Intergovernmental Panel on Climate Change), 2001. Climate Change 2001: The Scientific Basis. Working Group I of the IPCC, World Meteorological Organization-U.N. Environment Program, Geneva, Switzerland, www.ipcc.ch.

National Assessment Synthesis Team, Climate Change Impacts on the United States: The Potential Consequences of Climate Variability and Change. US Global Change Research Program, Washington DD, 2000, www.uwgcrp.gov.

National Research Council of the National Academies, 2001. Climate Change Science: An Analysis of Some Key Questions. National Academy Press, Washington DC, www.nap.edu.

Morris, M. Gery, M. Liu, G. Moore, C. Daly, and S. Greenfield. 1989. Sensitivity of a regional oxidant model to variations in climate parameters. In The Potential Effects of Global Climate Change on the United States, app. F, Air quality. Washington, DC: U.S. Environmental Protection Agency, Office of Policy, Planning and Evaluation.

Contacts:

Bonnie Holmes-Gen
Assistant V.P., Government Relations
American Lung Association of California
bhgen@alac.org

Vandana Bali,
Director, Clean Vehicles Program
American Lung Association of California
vbali@alac.org

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